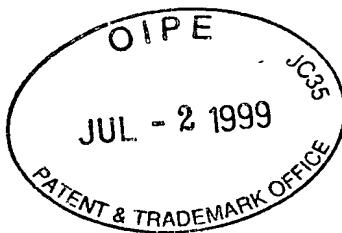


0524-2769-0 PCT



IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF: :

BERND BRUCHMANN ET AL : GROUP ART UNIT: 1711

SERIAL NO: 08/894,156 :

FILED: AUGUST 15, 1997 : EXAMINER: SERGENT

FOR: PREPARATION OF
BIURET-CONTAINING
POLYISOCYANATES

APPEAL BRIEF

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

This is an appeal of the Final Rejection dated February 2, 1999 of Claims 1-9. A Notice of Appeal, along with a petition for a two-month extension of time, is submitted herewith. **Proposed Findings of Fact and Conclusions of Law are included as Appendix II herewith. See Gechter v. Davidson, 43 USPQ2d 1030 (Fed. Cir. 1997).**

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is BASF Aktiengesellschaft having an address at 67056 Ludwigshafen, Fed. Rep. Germany.

7/18
M/M
7-14-99
JUL - 9 1999
TC 1700 MAIL ROOM
RECEIVED

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 1-9, all the claims in the application, stand rejected and are herein appealed.

IV. STATUS OF THE AMENDMENTS

An Amendment under 37 CFR 1.116 was timely filed on March 1, 1999. In an Advisory Action entered March 23, 1999, the Examiner indicated that upon the filing of an appeal, the amendment will be entered. The attached Appendix I reflects Claims 1-9 as amended by the above-referenced Amendment under 37 CFR 1.116.

A Declaration under 37 CFR 1.132 was also filed, on June 1, 1999 (Bruchmann Declaration). In an Advisory Action entered June 14, 1999, the Examiner indicated that the Declaration has been considered.

V. SUMMARY OF THE INVENTION

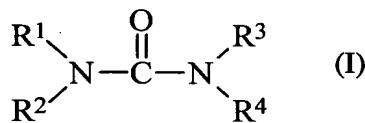
The invention relates to a process for the preparation of a polyisocyanate which contains one or more biuret groups by reacting

- a) an aliphatic or cycloaliphatic isocyanate containing two or more isocyanate groups (isocyanate a) with
- b) a tertiary alcohol or a mixture of water and a tertiary alcohol (biuretizing agent b)

at from 100 to 250°C, which comprises carrying out the reaction in the presence

c) of a stabilizer (c) consisting essentially of a catalytic amount of urea, ammonia,

biuret, a urea derivative of the formula I



(I)

in which R^1 , R^2 , R^3 and R^4 are hydrogen, C_1 to C_{10} alkyl or C_6 to C_{10} aryl, or

a carboxamide of the formula II



in which R^5 is C_1 to C_{12} alkyl which is unsubstituted or in which 1, 2 or 3 hydrogen atoms are replaced by a radical



See the specification at page 3, lines 1-38.

VI. ISSUES

Whether Claims 1-9 are unpatentable under 35 U.S.C. §103(a) over US 4,192,936 or

US 4,152,350, each to Möhring et al in view of US 3,903,127 or US 3,976,622, each to

Wagner et al, and US 3,367,956 to Hennig et al?¹

¹The disclosures of each of the Möhring et al patents, and the Wagner et al patents, respectively, are identical. Thus, we refer herein to US 4,152,350 of Möhring et al and US

VII. GROUPING OF THE CLAIMS

The claims each stand or fall separately.

VIII. ARGUMENT

Claims 1-9 stand rejected under 35 U.S.C. §103(a) as unpatentable over Möhring et al in view of Wagner et al, and Hennig et al. That rejection is untenable and should not be sustained.

Several basic factual inquiries must be made in order to determine obviousness or non-obviousness of claims of a patent application under 35 U.S.C. §103. These factual inquiries are set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966):

Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness of the subject matter is determined.

The specific factual inquiries set forth in Graham have not been considered or properly applied by the Examiner in formulating the rejection of the subject claims. Particularly, the scope and content of the prior art and the level of ordinary skill in the pertinent art were not properly determined, demonstrated and applied to the claimed invention. In the present case, proper consideration of the factual inquiries demonstrates the non-obviousness of the claimed invention.

"Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combinations". In re Geiger, 815 F.2d 686, 2 USPQ 2d 1276, 1278 (Fed. Cir. 1987). The Patent Office can only satisfy its burden to establish a *prima facie* case of obviousness "by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." In re Fine, 837 F.2d 1071, 5 USPQ 2d 1596, 1598 (Fed. Cir. 1988). Such teachings, suggestions or incentives are missing here.

As discussed in the specification, the biuret-containing polyisocyanate prepared by the known processes from tertiary alcohols and isocyanates leave much to be desired, since they are too dark in color for many applications and, in particular after prolonged storage, still include considerable quantities of readily volatile monomeric isocyanates.

Applicants have discovered an economic process by whose use it is possible to prepare biuret-containing polyisocyanates which are pale in color and whose contents of volatile isocyanates, particularly after prolonged storage, is low.

An essential feature of the claimed invention is the presence of a stabilizer (c) consisting essentially of a catalytic amount of a compound as defined. It is due to the presence of such component (c) as a catalyst, not as a biuretizing agent, in place of other known catalysts, such as those disclosed by Wagner et al at column 6, lines 30 to 42, that, unexpectedly, an improved product is obtained, as so factually demonstrated by the comparative evidence in the case. Note the results set forth for the products according to the Examples of the invention in Table 1 at page 9 of the specification compared to the results of the Comparative Examples in Table 2 at page 10 of the specification. A copy of Tables 1 and 2 appears at Appendix III of this Appeal Brief.

As is evident from the results set forth in these Tables, it is apparent that the products obtained by the claimed process evince significantly lower color numbers as well as their monomer content being significantly and materially lower.

Möhring et al discloses a process for the formation of allophanate containing biurets (column 3, line 41) comprising reacting an isocyanate with a biuretizing agent consisting of mixtures of a primary, secondary, or tertiary alcohol; a particular mono- or poly-amine having at least one aliphatically, cycloaliphatically or araliphatically bound primary amino group; and optionally water (column 3, lines 63-66). The use of a primary alcohol is preferred (column 3, lines 57-62 and column 5, lines 59-62). The process of Möhring et al thus clearly is significantly and materially different from the claimed invention.

Wagner et al discloses various biuretizing agents, including the presently-recited tertiary alcohol biuretizing agent and various substituted ureas, inclusive of the presently-recited catalytic stabilizer. Hennig et al discloses various substituted ureas, inclusive of the presently-recited catalytic stabilizer, as a biuretizing agent.

In rejecting the claims over the cited references, it is the Examiner's position that it would have been obvious to use the biuretizing agents of Wagner et al and Hennig et al in place of the amine component of Möhring et al, in that they allegedly function in an equivalent manner.

It is submitted that this is not a viable position for a number of reasons.

First of all, the recited stabilizer of the present claims is not an "amine containing" stabilizer. There are no amines in the stabilizer Markush group. There is no disclosure or suggestion in any of the cited prior art that the, for example, urea-containing biuretizing agents of Wagner et al or Hennig et al are, or would be expected to be, equivalent to the particular mono- or poly-amine compound of Möhring et al. Note that urea is not an amine.

The biuretizing agent in Möhring et al is a mixture of amines, alcohols, and optionally water (column 3, lines 63-66), not the amine alone. It is not clear why one of ordinary skill in the art would replace the biuretizing agent of Möhring et al, let alone only the amine therein, with another biuretizing agent, unless polyisocyanates of the type which Möhring et al produce, i.e., a mixture of biuret polyisocyanates and allophanate polyisocyanates, are disclosed as being formed with said another biuretizing agent. There is no disclosure or suggestion in Wagner et al or Hennig et al that such polyisocyanates are the results of their processes.

Indeed, the reaction products of the claimed process are practically allophanate-free biurets even though a tertiary alcohol is used as a reagent therein. The reason for this is that during the reaction in a first step a urethane is formed which in a second step is decomposed into an amine, CO₂ and an olefin. In a third step this amine forms urea with additional isocyanate and finally this urea forms biuret with additional isocyanate. Note, page 2, lines 1 to 5 of the specification. Since during the process the amine is formed in situ, no amine has to be introduced initially.

Component (c) in the claimed process is present as a catalyst in a catalytic amount, not as a biuretizing agent as so disclosed by Wagner et al and Hennig et al. Component (c) in the claimed process is used in place of a catalyst as disclosed by Wagner et al, resulting in unexpected improvements.

The Examiner's response to the above argument is that it is obvious to combine known biuretizing agents, and that it is immaterial what names, i.e., biuretizing agents, stabilizers, or catalysts, are used to describe the components. The Examiner further concludes that the catalytic amount of Applicants' stabilizer is comparable to the amounts of Möhring et al's nitrogen-containing agents.

Applicants respectfully submit that the name used is material. By reciting that stabilizer (c) is present in a catalytic amount, it is understood that this material influences the rate of reaction but does not itself enter into the reaction, as a biuretizing agent will. The present recital "catalytic amount" is clearly a claim limitation herein. Furthermore, even if the Examiner were correct that it would have been obvious to combine known biuretizing agents, this would at best present only a *prima facie* case of obviousness. The prior art neither discloses nor suggests that the addition of the relatively smaller amounts of the presently-recited stabilizer, such as urea or a substituted urea, materially affects both the color of the final biuret-containing polyisocyanate and the residual monomer content. Compare Comparative Example 6 or 12, which contain no stabilizer, with the comparable stabilizer-containing examples of the present invention, in Tables 2 and 1, respectively.

Further, the comparative evidence in the case, which compares the catalysts of Wagner et al (see Table 2) is a direct comparison with Wagner et al, clearly the closest prior art. This evidence could not have been predicted by persons skilled in the art.

In the Advisory Action dated March 23, 1999, the Examiner states that "Applicants have failed to set forth a persuasive response to the Examiner's position that the nitrogen containing agents of the prior art are equivalents, in view of the teachings of the secondary references. Furthermore, despite applicants' statement that Wagner et al constitute the closest available art, the position is taken that Möhring et al constitute the closest prior art, in view of the similarities of the respective processes."

The Examiner is incorrect. Since Möhring et al is concerned with the production of allophanate containing biurets, while neither Wagner et al nor the present invention are, Wagner et al is the closest prior art. To that end, the Bruchmann Declaration supports the above argument, since it demonstrates that the presently-claimed process produces a product

having only insignificant amounts of allophanate.

As the MPEP §716.02(e) makes clear, the Examiner's decision of what is the closest prior art is not conclusive when the Appellants have compared to prior art closer than that relied upon by the Examiner. See In re Holladay, 199 USPQ 516 (CCPA 1978) and Ex parte Humber, 217 USPQ 265 (Bd. App. 1961).

In the Advisory Action dated June 14, 1999, the Examiner states that "the [Bruchmann] declaration is not commensurate with the claims. The claims do not exclude or limit the presence of allophanate groups."

The Examiner is incorrect. The Bruchmann Declaration shows that the claimed invention **inherently** produces a material containing a relatively insignificant amount of such groups. Thus, the Bruchmann Declaration conclusively shows that the presently-claimed process produces significantly different final products from the final products of Möhring et al.

Claim 2 is separately patentable, because the combination of Möhring et al in view of Wagner et al, and Hennig et al neither discloses nor suggests the process of Claim 1, wherein the isocyanate (a) is a C₄ to C₃₀ diisocyanate or triisocyanate.

Claim 3 is separately patentable, because the combination of Möhring et al in view of Wagner et al, and Hennig et al neither discloses nor suggests the process of Claim 1, wherein the isocyanate (a) is hexamethylene-1,6-diisocyanate.

Claim 4 is separately patentable, because the combination of Möhring et al in view of Wagner et al, and Hennig et al neither discloses nor suggests the process of Claim 1, wherein the biuretizing agent (b) is a tertiary alcohol or a mixture of a tertiary alcohol and up to 80 mol% of water based on the sum of the components of the mixture.

Claim 5 is separately patentable, because the combination of Möhring et al in view of Wagner et al, and Hennig et al neither discloses nor suggests the process of Claim 1, wherein the tertiary alcohol is tert-butanol.

Claim 6 is separately patentable, because the combination of Möhring et al in view of Wagner et al, and Hennig et al neither discloses nor suggests the process of Claim 1, wherein from 0.5 to 20 mol% of biuretizing agent (b) is employed, based on the isocyanate groups in (a).

Claim 7 is separately patentable, because the combination of Möhring et al in view of Wagner et al, and Hennig et al neither discloses nor suggests the process of Claim 1, wherein from 0.01 to 2.0 mol% of a stabilizer (c) is employed, based on the isocyanate groups in (a).

Claim 8 is separately patentable, because the combination of Möhring et al in view of Wagner et al, and Hennig et al neither discloses nor suggests the process of Claim 1, wherein the reaction is carried out at from 140 to 220°C.

Claim 9 is separately patentable, because the combination of Möhring et al in view of Wagner et al, and Hennig et al neither discloses nor suggests the process of Claim 1, wherein the polyisocyanate containing biuret groups is prepared and then unreacted isocyanate (a) is removed from it down to a content of less than 0.5% by weight, based on the polyisocyanate which contains biuret groups.

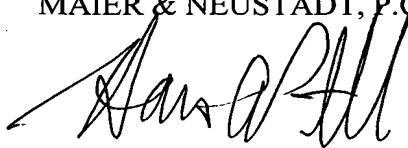
Accordingly, it is respectfully requested that this rejection be REVERSED.

IX. CONCLUSION

For the above reasons, it is respectfully requested that all the rejections still pending in the Final Office Action be REVERSED.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Harris A. Pitlick
Registration No. 38,779

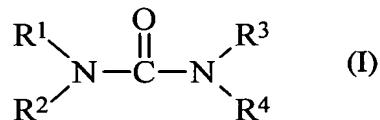
Crystal Square Five - Fourth Floor
1755 South Jefferson Davis Highway
Arlington, VA 22202
(703) 413-3000
Fax #: (703) 413-2220
NFO:HAP:

I:\atty\HAP\05242769.Ab.wpd

APPENDIX I

CLAIMS ON APPEAL

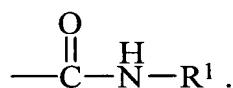
1. A process for the preparation of a polyisocyanate which contains one or more biuret groups by reacting
 - a) an aliphatic or cycloaliphatic isocyanate containing two or more isocyanate groups (isocyanate a) with
 - b) a tertiary alcohol or a mixture of water and a tertiary alcohol (biuretizing agent b) at from 100 to 250°C, which comprises carrying out the reaction in the presence
 - c) of a stabilizer (c) consisting essentially of a catalytic amount of urea, ammonia, biuret, a urea derivative of the formula I



in which R¹, R², R³ and R⁴ are hydrogen, C₁ to C₁₀ alkyl or C₆ to C₁₀ aryl, or a carboxamide of the formula II



in which R⁵ is C₁ to C₁₂ alkyl which is unsubstituted or in which 1, 2 or 3 hydrogen atoms are replaced by a radical



2. A process as claimed in claim 1, wherein the isocyanate (a) is a C₄ to C₃₀

diisocyanate or triisocyanate.

3. A process as claimed in claim 1, wherein the isocyanate (a) is hexamethylene-1,6-diisocyanate.
4. A process as claimed in claim 1, wherein the biuretizing agent (b) is a tertiary alcohol or a mixture of a tertiary alcohol and up to 80 mol% of water based on the sum of the components of the mixture.
5. A process as claimed in claim 1, wherein the tertiary alcohol is tert-butanol.
6. A process as claimed in claim 1, wherein from 0.5 to 20 mol% of biuretizing agent (b) is employed, based on the isocyanate groups in (a).
7. A process as claimed in claim 1, wherein from 0.01 to 2.0 mol% of a stabilizer (c) is employed, based on the isocyanate groups in (a).
8. A process as claimed in claim 1, wherein the reaction is carried out at from 140 to 220°C.
9. A process as claimed in claim 1, wherein the polyisocyanate containing biuret groups is prepared and then unreacted isocyanate (a) is removed from it down to a content of less than 0.5% by weight, based on the polyisocyanate which contains biuret groups.

APPENDIX II

PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

A. Findings of fact

1. As discussed in the specification, the biuret-containing polyisocyanate prepared by the known processes from tertiary alcohols and isocyanates leave much to be desired, since they are too dark in color for many applications and, in particular after prolonged storage, still include considerable quantities of readily volatile monomeric isocyanates.
2. Applicants have discovered an economic process by whose use it is possible to prepare biuret-containing polyisocyanates which are pale in color and whose contents of volatile isocyanates, particularly after prolonged storage, is low.
3. An essential feature of the claimed invention is the presence of a stabilizer (c) consisting essentially of a catalytic amount of a compound as defined.
4. It is due to the presence of such component (c) as a catalyst, not as a biuretizing agent, in place of other known catalysts, such as those disclosed by Wagner et al at column 6, lines 30 to 42, that, unexpectedly, an improved product is obtained, as so factually demonstrated by the comparative evidence in the case.
5. As is evident from the results set forth in Tables 1 and 2 of the specification, it is apparent that the products obtained by the claimed process evince significantly lower color numbers as well as their monomer content being significantly and materially lower.
6. Möhring et al discloses a process for the formation of allophanate containing biurets (column 3, line 41) comprising reacting an isocyanate with a biuretizing agent consisting of mixtures of a primary, secondary, or tertiary alcohol; a particular mono- or poly-amine having at least one aliphatically, cycloaliphatically or araliphatically bound primary

amino group; and optionally water (column 3, lines 63-66). The use of a primary alcohol is preferred (column 3, lines 57-62 and column 5, lines 59-62).

7. The process of Möhring et al thus clearly is significantly and materially different from the claimed invention.

8. Wagner et al discloses various biuretizing agents, including the presently-recited tertiary alcohol biuretizing agent and various substituted ureas, inclusive of the presently-recited catalytic stabilizer.

9. Hennig et al discloses various substituted ureas, inclusive of the presently-recited catalytic stabilizer, as a biuretizing agent.

10. The recited stabilizer of the present claims is not an "amine containing" stabilizer. There are no amines in the stabilizer Markush group.

11. There is no disclosure or suggestion in any of the cited prior art that the, for example, urea-containing biuretizing agents of Wagner et al or Hennig et al are, or would be expected to be, equivalent to the particular mono- or poly-amine compound of Möhring et al.

Note that urea is not an amine.

12. The biuretizing agent in Möhring et al is a mixture of amines, alcohols, and optionally water (column 3, lines 63-66), not the amine alone.

13. It is not clear why one of ordinary skill in the art would replace the biuretizing agent of Möhring et al, let alone only the amine therein, with another biuretizing agent, unless polyisocyanates of the type which Möhring et al produce, i.e., a mixture of biuret polyisocyanates and allophanate polyisocyanates, are disclosed as being formed with said another biuretizing agent.

14. There is no disclosure or suggestion in Wagner et al or Hennig et al that such polyisocyanates are the results of their processes.

15. The reaction products of the claimed process are practically allophanate-free biurets even though a tertiary alcohol is used as a reagent therein. The reason for this is that during the reaction in a first step a urethane is formed which in a second step is decomposed into an amine, CO₂ and an olefin. In a third step this amine forms urea with additional isocyanate and finally this urea forms biuret with additional isocyanate. Note, page 2, lines 1 to 5 of the specification. Since during the process the amine is formed in situ, no amine has to be introduced initially.

16. Component (c) in the claimed process is present as a catalyst in a catalytic amount, not as a biuretizing agent as so disclosed by Wagner et al and Hennig et al. Component (c) in the claimed process is used in place of a catalyst as disclosed by Wagner et al, resulting in unexpected improvements.

17. By reciting that stabilizer (c) is present in a catalytic amount, it is understood that this material influences the rate of reaction but does not itself enter into the reaction, as a biuretizing agent will.

18. The prior art neither discloses nor suggests that the addition of the relatively smaller amounts of the presently-recited stabilizer, such as urea or a substituted urea, materially affects both the color of the final biuret-containing polyisocyanate and the residual monomer content. Compare Comparative Example 6 or 12, which contain no stabilizer, with the comparable stabilizer-containing examples of the present invention, in Tables 2 and 1, respectively.

19. Further, the comparative evidence in the case, which compares the catalysts of Wagner et al (see Table 2) is a direct comparison with Wagner et al, clearly the closest prior art. This evidence could not have been predicted by persons skilled in the art.

20. Since Möhring et al is concerned with the production of allophanate containing

biurets, while neither Wagner et al nor the present invention are, Wagner et al is the closest prior art.

21. To that end, the Bruchmann Declaration supports the above argument, since it demonstrates that the presently-claimed process produces a product having only insignificant amounts of allophanate.

22. The Bruchmann Declaration shows that the claimed invention inherently produces a material containing a relatively insignificant amount of such groups. Thus, the Bruchmann Declaration conclusively shows that the presently-claimed process produces significantly different final products from the final products of Möhring et al.

B. Conclusions of law

1. Several basic factual inquiries must be made in order to determine obviousness or non-obviousness of claims of a patent application under 35 U.S.C. §103. These factual inquiries are set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966):

Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness of the subject matter is determined.

The specific factual inquiries set forth in Graham have not been considered or properly applied by the Examiner in formulating the rejection of the subject claims. Particularly, the scope and content of the prior art and the level of ordinary skill in the

pertinent art were not properly determined, demonstrated and applied to the claimed invention. In the present case, proper consideration of the factual inquiries demonstrates the non-obviousness of the claimed invention.

2. "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combinations". In re Geiger, 815 F.2d 686, 2 USPQ 2d 1276, 1278 (Fed. Cir. 1987). The Patent Office can only satisfy its burden to establish a *prima facie* case of obviousness "by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." In re Fine, 837 F.2d 1071, 5 USPQ 2d 1596, 1598 (Fed. Cir. 1988). Such teachings, suggestions or incentives are missing here.

3. The Examiner's decision of what is the closest prior art is not conclusive when the Appellants have compared to prior art closer than that relied upon by the Examiner. See In re Holladay, 199 USPQ 516 (CCPA 1978) and Ex parte Humber, 217 USPQ 265 (Bd. App. 1961). Applicants have compared to the closest prior art.

4. The present recital "catalytic amount" is a claim limitation herein.

5. The claimed subject matter would not have been obvious over the prior art.

6. The claimed invention is not unpatentable under 35 U.S.C. §103.

Table 1

Ex.	Biuretizing agent (b)	Stabilizer (c)	Temp. [°C]	NCO content [% by wt.]	Viscosity [mPa s]	C N [Hzzen]	Monomer content 0 d 21 d
1	tert-Butanol (tBuOH)	UR	180	22.0	4350	5	0.15 0.25
2	tBuOH	Eth UR	180	22.7	2290	10	0.20 0.41
3	tBuOH:water 19:1	UR	170	22.4	3340	7	0.08 0.22
4	tBuOH:water 19:1	UR	190	22.0	6030	10	0.10 0.21
5	tBuOH:water 19:1	Eth UR	180	22.7	2200	12	0.15 0.45
6	tBuOH:water 19:1	DM UR	180	22.7	2280	15	0.13 0.43
7	tBuOH:water 4.6:1	UR	180	22.2	5550	5	0.11 0.23
8	tBuOH:water 1.8:1	UR	180	22.0	6480	2	0.13 0.28
9	tBuOH:water 1:1	UR	180	22.2	5450	4	0.14 0.31
10	tBuOH:water 0.27:1	UR	180	21.4	12,600	10	0.14 0.28
11	tBuOH:water 1:1	UR	180	22.0	6120	12	0.12 0.27
12	tBuOH:water 1:1	UR	180	21.3	11,560	18	0.12 0.29
13	tBuOH:water 1:1	UR	180	20.8	18,200	22	0.13 0.25
14	tBuOH:water 19:1	Biuret	180	22.0	3860	15	0.14 0.27
15	tBuOH:water 19:1	Acetamide	180	22.6	3020		0.17 0.31
16	tBuOH:water 19:1	Samid	180	22.5	3000		0.14 0.34
17	tBuOH:water 19:1	Ammonia	180	22.0	2340	28	0.21 0.50

Table 2

Comp. Ex.	Biuretizing agent (b)	Acidic catalysts	Temp. [°C]	NCO content [% by wt.]	Viscosity [mpa·s]	C N [Hazen]	Monomer content	
							0 d	21 d
1	tert-Butanol (tBuOH)	BF ₃	150	22.9	2550	206	0.09	0.69
2	tBuOH	PTSS	150	21.7	5400	350	0.05	0.48
3	tBuOH	DEHP	180	22.0	4840	42	0.07	0.42
4	tBuOH	EHA	180	22.0	4660	38	0.09	0.42
5	tBuOH	HAC	180	22.1	4330	55	0.08	0.40
6	tBuOH:water 19:1	—	180	22.9	2130	44	0.09	0.53
7	tBuOH:water 19:1	PTSS	180	22.0	5550	371	0.11	0.91
8	tBuOH:water 19:1	PTSS	150	21.8	5360	256	0.03	0.49
9	tBuOH:water 19:1	DEHP	180	22.4	3300	32	0.10	0.53
10	tBuOH:water 19:1	EHA	180	22.4	3650	10	0.15	0.63
11	tBuOH:water 19:1	ClAc	180	22.3	3970	56	0.14	0.53
12	tBuOH:water 19:1	—	180	22.7	2090	32	0.12	0.61